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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/814,995	03/31/2004	Nicholas D. Spencer	ETH 111	8183
23579                      7590                      07/01/2009 Pabst Patent Group LLP 1545 PEACHTREE STREET NE SUITE 320 ATLANTA, GA 30309				
EXAMINER				
YANG, NELSON C				
ART UNIT		PAPER NUMBER		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/814,995

**Applicant(s)**

SPENCER ET AL.

**Examiner**

Nelson Yang

**Art Unit**

1641

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 March 2009.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.  
4a) Of the above claim(s) 5, 6 and 9 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-4, 7, 8 and 10-18 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 03 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

1. Claims 1-4, 7-8, 10-13, 15-18 are currently under examination.
2. Claims 5-6, 9, and 14 are withdrawn.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 recites that the gradient is suitable for analysis. However, it is unclear what structural limitations or features would render a gradient suitable for analysis, therefore rendering the claim indefinite.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-4, 7-12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed

invention. the specification fails to disclose the limitation that the substrate is exposed to the advancing front of a first solution for a time period sufficient to adsorb the first adsorbate onto the surface of the substrate. In particular, while the specification as originally presented discloses exposing the substrate to the first solution itself, it does not recite exposing it to the advancing front of the substrate.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 2, 4, 7, 10, 12-13, 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Natan et al. [US 6,242,264].

With respect to claim 1, Natan et al. teach the step of using a motorized translation stage to immerse a substrate for producing a gradient coating thereon, in order to immerse the substrate at a fixed rate that produces known, repeatable immersion conditions, thus producing a substrate wherein the first adsorbate is adsorbed in an amount decreasing in concentration from a first area to a second area (column 40, lines 49-64).

9. With respect to claim 2, Natan et al. teach the step of rotating the substrate by 90° and depositing a second adsorbate on the substrate with a gradient in a new immersion direction (column 40, lines 49-66).

10. With respect to claim 4, Natan et al. teach glass and metal substrates (column 3, lines 1-10).
11. With respect to claim 7, Natan et al. teach oxides on a substrate surface followed by immersion with adsorbants comprising polyelectrolytes such as PEG (column 3, lines 1-25, fig. 27, column 6, lines 39-55)
12. With respect to claims 10, 12, Natan et al. teaches the step of using a motorized translation stage to fully immerse a substrate for producing a gradient coating thereon, in order to immerse the substrate at a fixed rate that produces known, repeatable immersion conditions (column 40, lines 49-64).
13. With respect to claims 13, 16-18, Natan et al. teach the step of using a motorized translation stage to immerse a substrate for producing a gradient coating thereon, in order to immerse the substrate at a fixed rate that produces known, repeatable immersion conditions, thus producing a substrate wherein the first adsorbate is adsorbed in an amount decreasing in concentration from a first area to a second area (column 40, lines 49-64). Natan et al. further teach the step of rotating the substrate by 90° and depositing a second adsorbate on the substrate with a gradient in a new immersion direction (column 40, lines 49-66). Therefore, there would be a surface-chemical gradient comprising a first adsorbant in an amount decreasing in concentration from a first area to a second area on the substrate, and a second adsorbate increasing in concentration from the first area to the second area on the substrate, in a diagonal manner, thus producing radial symmetry.
14. The Office notes that claim 17 recites a product-by-process limitation. "[E]ven though product-by-process claims are limited by and defined by the process, determination of

patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). Therefore, since Natan et al. discloses all the structural limitations recited in the claim, the claim is anticipated.

15. With respect to claim 18, Natan et al. teach that the gradient is used as a biosensor which would involve diagnostics (abstract).

***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 3, 8, 15, are rejected under 35 U.S.C. 103(a) as being unpatentable over Natan et al. [US 6,242,264] in view of Genzer et al. [US 6,770,323].

With respect to claims 3, 8, Natan et al. teach a gradient as discussed above, but fail to teach a hydrophobicity gradient that changes the amount of water attracted to the surface over the length of the surface of a hydrophobic polymer surface substrate.

Genzer et al., however, teach that patterned substrates may be used as detection targets, and that one can produce a complex gradient that changes from hydrophobic to hydrophilic in

one direction and cationic to anionic in the other direction, such that a complex biomolecules will choose an optimum combination of hydrophobic/cationic forces, and one can conveniently measure the adsorption properties of complex molecular species (column 14, lines 54-65). Genzer et al. further teach that these gradients may be created using a silicon oxide covered wafers (column 15, lines 34-40) or PDMS substrates, which are hydrophobic substrates (column 5, lines 10-20), and coating the substrates with polyelectrolyte solutions, such as oligonucleotides (column 8, lines 5-15).

Therefore, one of ordinary skill in the art at the time of the invention would have been motivated to have patterned substrates with a complex gradient that changes from hydrophobic to hydrophilic in one direction and cationic to anionic in the other direction, such that a person of ordinary skill in the art would be able to conveniently measure the adsorption properties of complex molecular species.

18. With respect to claim 15, Genzer further teaches that the resulting patterned substrates can be used as detection targets (i.e. for analysis comprising exposing the surface-chemical gradient to a molecule). See column 14, lines 54-65.

19. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Natan et al. [US 6,242,264] in view of Kochersperger et al [US 5,656,034].

The teachings of Natan et al. have been disclosed above, but they fail to teach that the substrate is exposed to the first solution using a syringe pump.

Kochersperger teaches the step of using a syringe pump to deliver a solution, in order to provide a fluid dispensing means having an accurate volumetric fluid delivery. See column 1, lines 42-48.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Natan et al. with the step of using a syringe pump to deliver a solution, as taught by Kochersperger, in order to provide a fluid dispensing means that has an accurate volumetric fluid delivery. The advantage of providing accurate volumetric amounts provides the motivation to combine the teachings of Natan et al. and Kochersperger. In addition, one of ordinary skill in the art at the time of the invention would have had a reasonable expectation of success in including the syringe pump of Kochersperger with the method of Natan et al., since Natan et al. teaches deposition of fluid onto a substrate and the syringe pump is capable of delivery fluid onto a substrate.

### ***Response to Arguments***

20. Applicant's arguments with respect to claims 1-4, 7-8, 10-18 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

21. No claims are allowed.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson Yang whose telephone number is (571)272-0826. The examiner can normally be reached on 8:30-5:00.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Shibuya can be reached on (571)272-0806. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

23. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nelson Yang/  
Primary Examiner, Art Unit 1641